



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2014-0253; Directorate Identifier 2013-NM-257-AD]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: We propose to adopt a new airworthiness directive (AD) for certain The Boeing Company Model 747-100B SUD, 747-200B, 747-300, 747-400, 747-400D series airplanes. This proposed AD was prompted by an evaluation by the design approval holder (DAH) indicating that the upper deck tension ties are subject to widespread fatigue damage (WFD). This proposed AD would require repetitive inspections for cracking in the upper deck tension ties, and related investigative and corrective actions if necessary; tension tie replacement; and post-replacement repetitive inspections for cracking in the upper deck tension ties, and related investigative and corrective actions if necessary. We are proposing this AD to detect and correct fatigue cracking of the upper deck tension ties. Severed or disconnected tension ties at multiple locations could result in rapid decompression and loss of structural integrity of the airplane.

DATES: We must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this proposed AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may view this referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2014-0253; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Nathan Weigand, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6428; fax: 425-917-6590; email: nathan.p.weigand@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2014-0253; Directorate Identifier 2013-NM-257-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

Discussion

Structural fatigue damage is progressive. It begins as minute cracks, and those cracks grow under the action of repeated stresses. This can happen because of normal operational conditions and design attributes, or because of isolated situations or incidents such as material defects, poor fabrication quality, or corrosion pits, dings, or scratches. Fatigue damage can occur locally, in small areas or structural design details, or globally. Global fatigue damage is general degradation of large areas of structure with similar structural details and stress levels. Multiple-site damage is global damage that occurs in a large structural element such as a single rivet line of a lap splice joining two large skin panels. Global damage can also occur in multiple elements such as adjacent frames or stringers. Multiple-site-damage and multiple-element-damage cracks are typically too small initially to be reliably detected with normal inspection methods. Without intervention, these cracks will grow, and eventually compromise the structural integrity

of the airplane, in a condition known as WFD. As an airplane ages, WFD will likely occur, and will certainly occur if the airplane is operated long enough without any intervention.

The FAA's WFD final rule (75 FR 69746, November 15, 2010) became effective on January 14, 2011. The WFD rule requires certain actions to prevent catastrophic failure due to WFD throughout the operational life of certain existing transport category airplanes and all of these airplanes that will be certificated in the future. For existing and future airplanes subject to the WFD rule, the rule requires that design approval holders (DAHs) establish a limit of validity (LOV) of the engineering data that support the structural maintenance program. Operators affected by the WFD rule may not fly an airplane beyond its LOV, unless an extended LOV is approved.

The WFD rule (75 FR 69746, November 15, 2010) does not require identifying and developing maintenance actions if the DAHs can show that such actions are not necessary to prevent WFD before the airplane reaches the LOV. Many LOVs, however, do depend on accomplishment of future maintenance actions. As stated in the WFD rule, any maintenance actions necessary to reach the LOV will be mandated by airworthiness directives through separate rulemaking actions.

In the context of WFD, this approach is necessary to enable DAHs to propose LOVs that allow operators the longest operational lives for their airplanes, and still ensure that WFD will not occur. This approach allows for an implementation strategy that provides flexibility to DAHs in determining the timing of service information development (with FAA approval), while providing operators with certainty regarding the LOV applicable to their airplanes.

The identified unsafe condition is at airplane body station locations 880 to 1100 where the floor beams were replaced with tension ties during airplane conversion to special freighter or Boeing converted freighter. Tension ties have been determined to be

structure that is susceptible to WFD. WFD could cause multiple adjacent tension ties to become severed or disconnected from the frames, which could result in rapid decompression and loss of structural integrity of the airplane.

Relevant Service Information

We reviewed Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013. For information on the procedures and compliance times, see this service information at <http://www.regulations.gov> by searching for Docket No. FAA-2014-0253.

FAA's Determination

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements

This proposed AD applies to current and future Model 747-100B SUD, 747-200B, 747-300, 747-400, 747-400D series airplanes converted to special freighter or Boeing converted freighter configuration.

This proposed AD would require repetitive inspections for cracking in the upper deck tension ties, and related investigative and corrective actions if necessary; tension tie replacement; and post-replacement repetitive inspections for cracking in the upper deck tension ties, and related investigative and corrective actions if necessary; as specified in the service information identified previously, except as discussed under “Difference Between this Proposed AD and the Service Information.”

The phrase “related investigative actions” is used in this proposed AD. “Related investigative actions” are follow-on actions that (1) are related to the primary actions, and (2) further investigate the nature of any condition found. Related investigative actions in an AD could include, for example, inspections.

The phrase “corrective actions” is used in this proposed AD. “Corrective actions” correct or address any condition found. Corrective actions in an AD could include, for example, repairs.

The FAA worked in conjunction with industry, under the Airworthiness Directives Implementation Aviation Rulemaking Committee, to enhance the AD system. One enhancement was a new process for annotating which steps in the service information are required for compliance with an AD. Differentiating these steps from other tasks in the service information is expected to improve an owner’s/operator’s understanding of crucial AD requirements and help provide consistent judgment in AD compliance. The actions specified in the service information described previously include steps that are labeled as RC (required for compliance) because these steps have a direct effect on detecting, preventing, resolving, or eliminating an identified unsafe condition.

As noted in the specified service information, steps labeled as RC must be done to comply with the proposed AD. However, steps that are not labeled as RC are recommended. Those steps that are not labeled as RC may be deviated from, done as part of other actions, or done using accepted methods different from those identified in the service information without obtaining approval of an alternative method of compliance (AMOC), provided the steps labeled as RC can be done and the airplane can be put back in a serviceable condition. Any substitutions or changes to steps labeled as RC will require approval of an AMOC.

Difference Between this Proposed AD and the Service Information

Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013, specifies to contact the manufacturer for instructions on how to repair certain conditions, but this proposed AD would require repairing those conditions in one of the following ways:

- In accordance with a method that we approve; or

- Using data that meet the certification basis of the airplane, and that have been approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) whom we have authorized to make those findings.

Explanation of Compliance Time

The compliance time for the modification specified in this proposed AD for addressing WFD was established to ensure that discrepant structure is modified before WFD develops in airplanes. Standard inspection techniques cannot be relied on to detect WFD before it becomes a hazard to flight. We will not grant any extensions of the compliance time to complete any AD-mandated service bulletin related to WFD without extensive new data that would substantiate and clearly warrant such an extension.

Costs of Compliance

We estimate that this proposed AD affects 76 airplanes of U.S. registry.

We estimate the following costs to comply with this proposed AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspections (pre-modification and post-modification)	Up to 164 work-hours X \$85 per hour = \$13,940 per inspection cycle	\$0	Up to \$13,940 per inspection cycle	Up to 1,059,440 per inspection cycle
Modification	366 work-hours X \$85 per hour = \$31,110	\$0	\$31,110	\$2,364,360

We have received no definitive data that would enable us to provide cost estimates for the on-condition actions specified in this proposed AD.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator.

Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

The Boeing Company: Docket No. FAA-2014-0253; Directorate Identifier 2013-NM-257-AD.

(a) Comments Due Date

We must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 747-100B SUD, 747-200B, 747-300, 747-400, and 747-400D series airplanes, certificated in any category, as identified in Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013.

(d) Subject

Air Transport Association (ATA) of America Code 53, Fuselage.

(e) Unsafe Condition

This AD was prompted by an evaluation by the design approval holder (DAH) indicating that the upper deck tension ties are subject to widespread fatigue damage (WFD). We are issuing this AD to detect and correct fatigue cracking of the upper deck

tension ties. Severed or disconnected tension ties at multiple locations could result in rapid decompression and loss of structural integrity of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Inspections, Related Investigative Actions, and Corrective Actions

For airplanes identified as Group 1, Configuration 2; and Group 2; in Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013: Before the accumulation of 10,000 flight cycles after conversion to special freighter or Boeing converted freighter configuration, or within 2,000 flight cycles after the effective date of this AD, whichever occurs later, do the actions specified in paragraph (g)(1) or (g)(2) of this AD, and do all applicable related investigative and corrective actions, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013, except as provided by paragraph (h) of this AD. Do all applicable related investigative and corrective actions before further flight. Repeat the inspection of the forward and aft tension tie channels thereafter at the applicable time and intervals specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013.

(1) At each tension tie station from 880 to 1100: Do a detailed inspection for cracks in the forward and aft tension tie channels.

(2) At each tension tie station from 880 to 1100: Do a detailed inspection for cracks in the forward and aft tension tie channels, and do a surface high frequency eddy current (HFEC) inspection for cracks around fasteners in the tension tie channels.

(h) Exceptions to Service Information Specifications

If, during accomplishment of the related investigative action or inspections required by this AD, any cracking is found, and Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013, specifies to contact Boeing for repair

instructions: Before further flight, do the repair using a method approved in accordance with the procedures specified in paragraph (k) of this AD.

(i) Tension Tie Replacement

After the accumulation of 13,000 total flight cycles; but before the accumulation of 22,000 flight cycles after conversion to special freighter or Boeing converted freighter configuration, or within 2,000 flight cycles after the effective date of this AD, whichever occurs later: Do the tension tie replacement, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013, except as provided by paragraph (h) of this AD. Accomplishment of the actions required by this paragraph terminates the inspection requirements of paragraph (g) of this AD.

(j) Post-tension Tie Replacement Inspections, Related Investigative Actions, and Corrective Actions

After accomplishing the actions required by paragraph (i) of this AD: At the applicable time specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013, do the actions specified in paragraph (j)(1) or (j)(2) of this AD; and do all applicable related investigative and corrective actions; in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013, except as provided by paragraph (h) of this AD. Do all applicable related investigative and corrective actions before further flight. Repeat the applicable inspection of the forward and aft tension tie channels thereafter at the applicable time and intervals specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2866, dated December 4, 2013.

(1) At each tension tie station from 880 to 1100: Do a detailed inspection for cracks in the forward and aft tension tie channels.

(2) At each tension tie station from 880 to 1100: Do a detailed inspection for cracks in the forward and aft tension tie channels, and do a surface HFEC inspection for cracks around fasteners in the tension tie channels.

(k) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle Aircraft Certification Office (ACO), FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in the paragraph (l)(1) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair required by this AD if it is approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO to make those findings. For a repair method to be approved, the repair must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(4) If the service information contains steps that are labeled as RC (Required for Compliance), those steps must be done to comply with this AD; any steps that are not labeled as RC are recommended. Those steps that are not labeled as RC may be deviated from, done as part of other actions, or done using accepted methods different from those identified in the specified service information without obtaining approval of an AMOC, provided the steps labeled as RC can be done and the airplane can be put back in a

serviceable condition. Any substitutions or changes to steps labeled as RC require approval of an AMOC.

(I) Related Information

(1) For more information about this AD, contact Nathan Weigand, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6428; fax: 425-917-6590; email: nathan.p.weigand@faa.gov.

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may view this referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221.

Issued in Renton, Washington, on April 14, 2014.

Jeffrey E. Duven,
Manager,
Transport Airplane Directorate,
Aircraft Certification Service.

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